

**DRAFT  
SAMPLING AND ANALYSIS PLAN  
FOR  
MELVILLE NORTH LANDFILL  
NAVAL EDUCATION AND TRAINING CENTER  
NEWPORT, RHODE ISLAND**

Prepared for:

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OHM Project 16143SAP



**OHM Remediation  
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A Subsidiary of OHM Corporation

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## ***1.0 INTRODUCTION***

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OHM Remediation Services Corporation, Inc. (OHM) is pleased to submit this Sampling and Analysis Plan (SAP) to the U.S. Navy, Naval Facilities Engineering Command, under RAC N62470-93-C-0293.

This SAP pertains to all sampling matrices which will be encountered for the remediation of the Melville Landfill Site, Newport, Rhode Island; as per Delivery Order No. 025.

This SAP is written by the OHM Field Analytical Services Group.

### **1.1 SITE DESCRIPTION**

The Melville North Landfill Site is an approximate eight acre area, located on the U.S. Naval Base, Newport, Rhode Island. The site was utilized as a landfill from circa 1945-1955. Materials disposed at the landfill include soil, construction debris, spent acids, paints, waste oil, and PCBs.

## ***2.0 SAMPLING AND ANALYSIS ACTIVITIES***

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The following sampling and analysis tasks will be performed in support of the remedial action at the Melville Landfill Site:

- Mobilization of one (1) OHM sample technician to the site.
- Field screening of excavated soil for volatile organic compounds with a photo-ionization detector (PID). The excavated soil will be staged into separate stockpiles, ~~based upon~~ the PID readings.
- Field screening of excavated soils for total petroleum hydrocarbons (TPH) with the use of commercially-available test kits. The excavated soil will be staged and stockpiled on the basis of the TPH levels.
- Sampling of stockpiled soil for disposal parameters.
- Post-excavation sampling of the excavation walls and floor, upon completion of excavation activities.
- Sampling of all accumulated water, decontamination water, and all contractor generated wastes, for disposal parameters.

### **2.2 MOBILIZATION**

OHM will mobilize one (1) sample technician from the OHM Regional Office in Trenton, New Jersey. Additional support of personnel and/or material will be provided by the OHM Divisional Office in Hopkinton, Massachusetts.

All sampling activities will be performed by the OHM sample technician, who is part of the Field Analytical Services Group. The sample technician is specially trained in the required sampling protocols, which include: preparation of the sampling event, field screening procedures, accurate documentation, various sampling techniques, sample preservation, sample shipment, and health and safety considerations.

### **2.3 FIELD SCREENING**

Field screening activities at the Melville Landfill Site will include:

- The use of a PID for the real-time determination of volatile organic compounds (VOCs) in excavated soil.

### 2.3.1 Excavated soil staging

All excavated soil will be segregated into separate stockpiles on the basis of the results of PID and TPH screening. Soils will be placed into the following categories:

- Unimpacted Soil- Soil which shows no visible contamination or petroleum odors, or yields PID readings less than 10 ppm.
- Rhode Island regulated Soil- Soil which shows visible contamination and/or petroleum odors, or yields PID readings at, or greater than, 10 ppm.
- Restricted Non-hazardous Soil- Soil which shows visible contamination and/or petroleum odors, or yields sustained PID readings at levels greater than 100 ppm.
- Hazardous Waste Soil- Soil which shows visible contamination, or petroleum odors, or yields sustained PID readings greater than 1000 ppm.

### 2.4 EXCAVATED SOILS SAMPLING

The excavated soil piles will be sampled for the appropriate testing parameters.

- Each stockpile of unimpacted soil will be sampled at a frequency of one composite sample per 400 CY.
- Each stockpile of RI regulated soil will be sampled at a frequency of one composite per 150 CY; a second composite sample will be generated for every 500 CY of soil.
- Each stockpile of restricted non-hazardous soil will be sampled at a frequency of one composite per 150 CY; a second composite sample will be generated for every 500 CY of soil.
- Each stockpile of hazardous waste soil will be analyzed at a frequency of one composite sample per 40 CY.

#### 2.4.1 Sample Quantities

Based upon the quantities of excavated materials anticipated, based upon information given in the Bid Specifications, OHM anticipates the following quantities of samples:

<u>Item</u>	<u>Soil quantity</u> (CY)	<u>Sample Quantity</u>
Hazardous waste soil	10	1
Restricted non-hazardous soil	410	3

RI regulated soil	3,700	25
Non-hazardous debris	50	1

## 2.5 POST-EXCAVATION SOIL SAMPLING

Within two (2) days of the completion of all excavation activities, OHM will soil samples around the excavation perimeter. Soil samples will be obtained at every fifty (50) linear feet of the excavation perimeter.

## 2.6 CONTAMINATED WATER SAMPLING

OHM will sample all contaminated wastewater which was generated as a result of dewatering and decontamination activities. Wastewater will be stored in 55-gallon drums.

One contaminated water sample will be obtained for every 1,000 gallons (18-20 drums).

### **3.0 DATA QUALITY OBJECTIVES**

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USEPA currently defines five levels of data quality for environmental projects, which relate to data precision, accuracy, and completeness.

1. Screening (Level 1): This provides the lowest data quality, but the most rapid results. It is often used for health and safety monitoring at the site, preliminary comparison to ARARs (Applicable or Relevant and Appropriate Requirements), initial site characterization to locate areas for subsequent and more accurate analyses, and for characterization to locate areas for subsequent and more accurate analyses, and for engineering screening of alternatives (bench-scale tests). These types of data include those generated on-site through the use of organic vapor analyzers, temperature and conductivity meters and other similar real time monitoring equipment at the site.
2. Field Analyses (Level 2): This provides rapid results and better quality than in Level 1. Analyses include mobile lab generated data.
3. Engineering (Level 3): This provides an intermediate level of data quality and is used for site characterization and engineering analyses. It may include mobile lab generated data and some analytical lab methods (e.g., laboratory data with quick turnaround used for screening, but full quality control documentation).
4. Conformation (Level 4): This provides the highest level of data quality and is used for purposes of risk assessment, engineering design, and cost analyses. These analyses require full CLP (Contract Laboratory Program) analytical and data validation procedures in accordance with U.S. EPA recognized procedures.
5. Non-Standard (Level 5): This refers to analyses by non-standard protocols, for example, when exacting detection limits, or analysis of an unusual chemical compound is required. These analyses often require method development or adaption. The level of quality control is usually similar to Level 4 data.

#### **3.1 TASK-RELATED QA/QC OBJECTIVES**

The sampling and analytical tasks identified in Section 2 of this SAP will be performed in order to achieve the following QA/QC objectives:

- Field screening of site activities for the real-time determination of volatile organic contamination of ambient air for health and safety considerations.

All field screening with the PID and LEL/O<sub>2</sub> meter will be performed within EPA QA1 data quality objectives. These instruments will provide real-time information for health and safety purposes, only.

- Disposal of all drill cuttings, site water, excavated soil, and spent carbon. Disposal sampling does not require any special QC considerations. Verification of the excavated soil results will be provided by post-excavation sampling and analysis.
- Post-excavation soil sampling in order to establish "cleanliness" of remaining site soil. Post-excavation sampling and analysis will be performed within NEESA Level C criteria.



- QA/QC samples In addition to the scheduled samples, OHM suggests that duplicate samples, MS/MSD, an equipment rinsate, and one trip blank sample should be obtained for the post-excavation soil sample, in order to increase the data quality level. Indeed, NEESA Level CQA/QC criteria calls for 10% field duplicates.

## **4.0 PROJECT ORGANIZATION**

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### **4.1 OHM FIELD ANALYTICAL SERVICES**

OHM provides sampling services through the Eastern Region Field Analytical Services (FAS) Group. The FAS group consists of five sample technicians, three field chemists, three project chemists, and a senior project chemist. These individuals are capable of providing a quality sampling effort, from the initial site characterization, through the sampling event.

#### **Sample Technician**

An OHM sample technician or field chemist will perform all site sampling activities. OHM sample technicians are trained in the accurate and complete documentation of the sampling event, and are familiar with all sampling procedures for various matrices.

OHM has two sample technicians and three field chemists who are based out of the Trenton, New Jersey Regional office; they will be utilized, if available. Otherwise, a sample technician or a field chemist will be mobilized from the Hopkinton, Massachusetts Divisional office.

#### **Project Chemist**

Bob Lynch will be the project chemist for this project. As project chemist, he will be able to provide support for the sample technician from the Trenton office. This may be in the form of technical assistance, or for the procurement of sampling materials required.

The sample technician consults with the project chemist, as needed, for assistance with sampling protocols. The project chemist serves as the liaison between the project manager, the sample technician, and the laboratory.

#### **Senior Project Chemist**

Ron Kenyon is the senior project chemist and the QC manager of the FAS group. He is routinely in communication, often on a daily basis, with the on-site sample technician and project chemist.

### **4.2 PROJECT MANAGEMENT**

#### **Site Supervisor**

All on-site activities are coordinated by the OHM site supervisor. The sample technician will coordinate and communicate all sampling efforts with the site supervisor.

#### **Project Manager**

The OHM Project Manager is Dan Douthwright. He serves to coordinate all project related decisions. The project chemist acts as a liaison between the laboratory and the project manager. The program manager will be consulted immediately if any sampling and analysis problems occur, and the corrective action taken.

### QC Officer

The project chemist or senior project chemist will act as the QC officer. Responsibilities include:

- Review of all sampling documentation, to include chain-of-custody forms.
- Communication with laboratory to assure proper laboratory procedures and QC protocols are adhered to.

## **5.0 SAMPLING PROCEDURES**

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The following sections describe the procedures for all of the sample matrices pertinent to the Melville North Landfill Site.

### **5.1 CONTAMINATED WATER SAMPLING**

A 1/4-inch drum thief will be used to obtain the water (liquid) samples. The OHM sample technician will obtain a representative sample of liquid from the drums. The liquid will be transferred to two (2) 40-ml vials for volatile organic analysis. Each vial will be preserved with 4 drops of concentrated HCL; the vials will be completely filled, allowing for no headspace (so that any volatile constituents do not escape).

Remaining liquid sample will be sampled into a 1-L amber glass container for semi-volatiles analysis) and a 1-L polypropylene container (for metals analysis). The metals sample will be preserved with 4 drops of concentrated HCL; the vials will be completely filled, allowing for no headspace (so that any volatile constituents do not escape).

Remaining liquid sample will be sampled into a 1-L amber glass container for semi-volatiles analysis) and a 1-L polypropylene container (for metals analysis). The metals sample will be preserved with 4 drops of concentrated nitric acid.

### **5.2 EXCAVATED SOIL STOCKPILE SAMPLING**

Each stockpile will be sampled by the use of a disposable polypropylene scoop. Grab samples for each stockpile will be obtained at the surface and at a 4-foot depth into each stockpile. A soil auger with an extension will be used at sample 4-feet into the stockpile. A minimum of 3 samples will be obtained 4-feet into each stockpile. At least 3 samples will be obtained from the stockpile surface (0-6").

The grab samples will be composite into an 1-L glass container. All stones, twigs, vegetation, and non-soil debris will be manually removed prior to transfer to the soil to the container. The grab samples will be biased towards areas of visual contamination.

The composite sample will be obtained for each soil stockpile. Each composite sample will consists of, at minimum, six decreet grab samples of the excavated soil, as described above.

The excavation (stockpile) samples will be analyzed for the parameters of concern.

### **5.3 POST-EXCAVATION SOIL SAMPLING**

Upon completion of remedial activities, the OHM sample technician will obtain post-excavation soil samples. Each post-excavation sample will be located at the perimeter of the excavation soil samples. Each post-excavation sample will be located at the perimeter of the excavation, at intervals of fifty (50) liner feet. Approximately fifteen (15) post-excavation samples are anticipated for this project.

Each post-excavation sample will be obtained using stainless steel trowels. Soil samples will be obtained at a depth of 0-3-inches of the surface. All loose debris, rocks, twigs, and other vegetation. will be removed from the soil. The soil is then transferred to the appropriate sample containers.

The sample for volatile analysis is obtained, first. The soil is transferred to an EPA-clean 4-oz. glass container. The container is completely filled, but not compacted, to allow for no headspace. The transfer of



soil to the container is made within a short time frame, with a minimal disturbance of the sample (to remove foreign matter, as described above).

The remaining sample is obtained in a EPA-clean 16-oz. amber glass container.

### **5.3.1 QA/QC Protocols**

Quality assurance/quality control (QA/QC) is an integral component of post-excavation sampling and analysis. A quality sampling events is assured by the use of proper decontamination procedures and the use of QC samples.

The sample trowel will be adequately de-contaminated prior to, and between, each sample point. Decontamination procedures are discussed in Section 6.7 of this SAP.

QC samples will be obtained, in addition to the original post-excavation samples. QC samples to be obtained will include duplicate samples, equipment rinsates, and a field blank sample. These samples are discussed in Section 6.6 of this SAP.

## 6.0 DOCUMENT QA/QC, SAMPLE MANAGEMENT, AND FIELD QC PROCEDURES

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Sample integrity is a key element in any project. Sample integrity strengthens the validity of the analytical data, and can be used for legal documentation if needed. Sample integrity is maintained by OHM through proper sample collection, documentation, and sampling equipment maintenance.

### 6.1 SAMPLE LABELS

Correct sample labeling and the corresponding notation of the sample ID numbers in the field logbook are necessary to prevent misidentification of samples and their eventual results. All sample labels will be filled out legibly and with indelible ink. They will be affixed to the sample container and covered with clear tape. The following presents an example of a sample label.

LABEL SAMPLE	
PROJECT NO.: 16143	DATE:
SAMPLE:	
TAKEN BY:	TIME:
WITNESS:	

The following information is recorded on the label using indelible ink:

- Project number - 16143
- Date--month, day, and year
- Time--Military hours (e.g., 1000, 1400, 2320) for Eastern Standard Time
- Samples--Description of sample
- Analyze--Analysis which will be performed, if more than one analysis is being done on samples from that project
- Preservative--If used
- Taken By--Initials of person taking sample
- Witness--Initials of person witnessing or assisting in taking sample
- Sample Number--Assigned from laboratory log book. Write number in blank corners of label. Sample numbers will be assigned numerically starting with 001. The OHM project number (16143) will be used as prefix

Example: 16143-001

- Number of Jars--Used with duplicate samples or when one jar cannot hold all the sample.



Every sample collected will be labeled in the above manner. Information will be printed neatly, except for initials which can be written. After the sample is collected and the label is securely attached, the sample is logged into the sample log book with the sample number written on the sample label.

## **6.2 SAMPLE CUSTODY AND HANDLING**

An important consideration for the collection of environmental data is the ability to demonstrate that analytical samples have been obtained from predetermined locations and that they have reached the laboratory without alteration. Evidence of collection, shipment, laboratory receipt, and laboratory custody until disposal must be documented to accomplish this. Documentation is accomplished through an Analysis Request and Chain-of-Custody Record that records each sample and the individuals responsible for sample collection, shipment, and receipt. A sample is considered in custody if it is:

- In a person's actual possession
- In view after being in physical possession
- Sealed so that no one can tamper with it after having been in physical custody
- In a secured area, restricted to authorized personnel

Overall, chain-of-custody documentation will begin when laboratory personnel record bottle lot numbers during the transfer of bottles to field personnel. Field personnel will then maintain custody of the bottles until sample collection, at which time they will record in their field notes the lot numbers of all bottles used for each sample. A copy of the lot number information will accompany the samples to the laboratory and will be included in the data packages.

Sample custody will be initiated by field personnel upon collection of samples. Labels and log information will be checked to verify that identification is correct. Samples will be packaged to prevent breakage or leakage during transport. Chain-of-custody information will be supplied with the samples and shipped by commercial carriers. The standard OHM Chain-of-Custody is presented in Appendix A.

## **6.3 FIELD DOCUMENTATION**

Several types of documentation will be prepared in the field by the project chemist in order to record the sampling activities and observations.

### **6.3.1 Field Notebooks**

Field notes regarding all sampling and field activities will be kept in a bound notebook with pre-numbered pages. Indelible ink will be used for all entries. It will include among other things:

- Field parameter observations
- Locations of sampling points and corresponding sample numbers
- Documentation of individual samples comprising the composite samples
- Descriptions of deviations from sampling plan
- Signatures of personnel responsible for observations.

## **6.4 FIELD MANAGEMENT AND SHIPMENT**

Upon collection in the field, samples will be properly labeled as discussed and stored in a cool place away from sunlight. Field samples will tighten all container lids, place each sample container in a sealed polyethylene bag, and store the samples in insulated containers, which will be used to transport samples to



the laboratory. The containers, preservative, and holding times for this project are presented in Table 4. Sufficient incombustible, absorbent, cushioning material will be packed in the shipping container to minimize the possibility of sample container breakage. The insulated containers will be secured using nylon strapping tape and custody seals to ensure that samples have not been disturbed during transport. Samples for chemical analysis will be promptly shipped to the laboratory so that they arrive within 24 hours of collection. Samples for geotechnical analysis may be held on site for longer periods. Transportation of samples must be accomplished not only in a manner designed to protect the integrity of the sample, but also to prevent any detrimental effects from the potentially hazardous nature of the samples.

Regulations for packaging, marking, labeling, and shipping of hazardous materials, substances and wastes are promulgated by the U.S. Department of Transportation (DOT) and described in the 49 CFR 171 through 177. In general, these regulations were not intended to cover the shipment of environmental samples collected at hazardous waste sites. Environmental samples usually contain low concentrations of hazardous substances when compared with most of the concentrated materials regulated by the DOT. However, the U.S. EPA has deemed it prudent to package, mark, label, and ship samples observing these DOT procedures, as appropriate.

## **6.5 FIELD SAMPLING QUALITY CONTROL**

Adherence to rigid quality control/quality assurance (QA/QC) protocols is a necessary component of sampling and analysis activities in support of this project.

Sampling QA/QC is assured by the performance of the following tasks:

- Adequate planning of the sampling event, to include the choice of sample locations.
- Accurate documentation of the sampling event, as described in Section 5 of this SAP.
- Decontamination of sampling apparatus prior to each location.
- The use of QA/QC samples: duplicates, matrix spike, matrix spike duplicate, equipment rinsate blanks, field blanks, and trip blanks, as necessary.

NEESA Level E and Level C QA/QC criteria require the following QC samples to be obtained.

## **6.6 QA/QC SAMPLES**

The following QA/QC samples are anticipated for this removal action:

- Duplicates. Field duplicates will be generated to assess the precision of the sampling and analysis results. The percentage difference between analysis of duplicate samples is a measure of precision; the results of analysis of duplicate samples should not vary outside of accepted criteria.
  - Duplicate samples will be obtained at a frequency of 10% for post-excavation activities. Two (2) soil duplicate samples are anticipated for this removal action.
- Equipment rinsates. A field equipment rinsate will be performed, once a day, for all non-disposable sampling equipment (e.g. sampling trowels). After decontaminating the sampling apparatus, distilled/de-ionized (DI) water will be passed over the apparatus; the water will be collected into an EPA-clean glass container. Analysis of the rinsate water should indicate that lead is not transferred from the sampling apparatus, i.e. cross-contamination between sampling points does not occur. One (1) equipment rinsate is anticipated for this project.



- Field blank. A field blank is generated by collecting the DI source water, used for decontamination of the sampling apparatus, into a container. The field blank water is analyzed for the parameters of interest. One (1) field blank will be obtained for this project.

#### **6.7 DECONTAMINATION PROCEDURES**

All non-disposable sampling equipment (e.g. stainless steel trowels) will be decontaminated prior to each sample point. The following procedures will be used:

- Detergent (non-phosphate)/water wash
- Tap water rinse
- 10% nitric acid rinse
- Distilled/de-ionized (DI) water rinse
- Acetone rinse
- Air dry

All disposable sampling equipment (e.g. polypropylene scoops) will be discarded, immediately, after each sampling point.

**TABLE 6.1  
CONTAINER AND PRESERVATION REQUIREMENTS  
FOR REMEDIAL CONSTRUCTION ACTIVITIES  
MELVILLE NORTH LANDFILL, NEWPORT, RHODE ISLAND**

<i>Parameter</i>	<i>Matrix</i>	<i>Sample Container</i>	<i>Container Volume</i>	<i>Preservation</i>	<i>Maximum Holding Time</i>
TCLP - Volatiles	Soil	Glass w/Teflon lined cap	4 oz	4° C	14 days
TCLP - Volatiles	Aqueous	3x vial w/Teflon lined septa	40 ml	4° C pH < 2 w/ HCL	14 days
TCLP - Semi-Volatiles	Soil	Glass w/Teflon lined cap	8 oz	4° C	Extract w/in 14 days; Analyze w/in 40 days of extraction
TCLP - Semi-Volatiles	Aqueous	Amber glass w/Teflon lined cap	1-L	4° C	Extract w/in 7 days; Analyze w/in 40 days of extraction
TCL - PCB/Pest.	Soil	Glass w/Teflon lined cap	8 oz	4° C	Extract w/in 14 days; Analyze w/in 40 days of extraction
TCL - PCB/Pest.	Aqueous	Amber glass w/Teflon lined cap	1-L	4° C	Extract w/in 7 days; Analyze w/in 40 days of extraction
TCLP - Metals	Soil	Glass w/Teflon lined cap	8 oz	4° C	6 months
Total Petroleum Hydrocarbons (TPH)	Soil	Glass w/teflon lined cap	8 oz.	4° C	Extract within 28 days; analyze withing 40 days of extraction
Total Petroleum Hydrocarbons (TPH)	Aqueous	Glass w/teflon lined cap	8 oz.	4° C	Analyze within 28 days
TCLP - Metals	Aqueous	Poly glass w/Teflon lined cap	1-L	4° C pH < 2 w/ nitric acid	6 Months
Paint filter	Soil	Glass w/teflon lined cap	8 oz.	4° C	
Lead, total	Soil	Glass w/teflon lined cap	8 oz.	4° C	6 Months
Aromatic volatile organics	Agueous	3 x vial w/teflon lined septa	40 ml	4° C pH< 2w/HCl	14 days
Halogenated volatile organics	Agueous	3 x vial w/teflon lined septa	40 ml	4° C pH< 2w/HCl	14 days

## **7.0 CALIBRATION PROCEDURES AND FREQUENCY**

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### **7.1 FIELD INSTRUMENT CALIBRATION**

All field laboratory instrumentation shall be calibrated according to manufacturer's specifications.

#### **7.1.1 HNU Photoionization Detector**

HNU photoionization detector, model PI-101. The HNU shall be calibrated twice daily - morning and afternoon. The calibration gas shall be 70 ppm isobutylene.

### **7.2 LABORATORY INSTRUMENT CALIBRATION**

The laboratory procedures relevant methods shall be found in the laboratory Quality Assurance Plan.

## **8.0 ANALYTICAL PROCEDURES**

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The analytical procedures which will be utilized for this project are discussed below. All laboratory analysis will consist of standard EPA SW-846, or equivalent methods. The laboratory will perform all associated QC procedures associated with each method.

### **8.1 DISPOSAL ANALYSIS**

#### **8.1.1 Excavated Soils**

All RI regulated soil samples, all restricted non-hazardous soil samples, and all hazardous waste soil samples, will be analyzed for:

- Total petroleum hydrocarbons (TPH)
- Paint filter test

All composite samples (1 per 500 CY) of RI regulated soil and restricted non-hazardous soil will be analyzed for the following parameters:

- RCRA Characterization: reactivity, corrosivity, ignitability
- Toxicity characteristic leaching parameter (TCLP):
  - Volatiles
  - Semi-volatiles
  - Metals
- Volatile organic compounds (8240)
- Polychlorinated biphenyls (PCBs) (8080)
- Lead, total (7421)

Unimpacted soils will be analyzed for the following parameters:

- TCLP-volatiles
- semi-volatiles
- metals
- TPH (8015-modified)
- PCBs (8080)

### **8.1.2 Contaminated Water**

Each composite sample of contaminated water will be analyzed for the following parameters:

- TPH (8015-modified)
- Halogenated volatile organics (8010)
- Aromatic volatile organics (8020)
- pH (9040)

The analytical procedures which will be used for this project are described below. All laboratory analysis will be standard EPA methods. The laboratory will perform all associated QC procedures associated with each method.

## **8.2 POST-EXCAVATION SOIL SAMPLES**

All post-excavation (15, approx.), and associated QA/QC (4, approx.) Samples will be analyzed for the following parameters:

TPH (full parameters):	volatiles
	semi-volatiles
	pesticides
	herbicides
	metals

### **8.2.1 Further Characterization**

OHM suggests, that TCLP testing, only, of the post-excavation samples may not provide enough information to the "cleanliness" of the remaining soil. TCLP is used to establish whether, or not, the soil is hazardous; the analytical results are compared to regulatory thresholds for each TCLP-analyte.

Post-excavation soil analysis is commonly based upon total levels of target analytes, versus TCLP-levels which are based upon leachable levels (which are, generally, less than totals) of analytes. The Rhode Island Department of Environmental Management should have existing standards for background levels of the compounds of concern for the Melville Landfill Site.

These compounds might include Target Compounds List (TCL)-volatile organics, semi-volatile organics, PCBs; Target Analyte List (TAL)-metals, and TPH.

## **9.0 DATA REDUCTION, VALIDATION AND REPORTING**

### **9.1 DATA REDUCTION AND TABULATION**

Data generated from the site activities can be grouped into two broad categories:

- Field data, such as data collected during VOC screening; and
- Chemical data for environmental samples generated by the project laboratory and accompanying QA/QC data package deliverables as required for DQO Level II and Level III;

These data will be compiled and managed using a central project filing system. The field and laboratory data filing system will be a manual storage system established at the Contractor's field office at the Site. Field and laboratory data will be filed chronologically. Field log books, sample logs, sample data sheets, chain-of-custody records, laboratory log books, and laboratory calculation sheets shall be labeled with a task number and date.

Chemical data shall be stored in a spread-sheet based system (e.g., LOTUS 123, EXCEL), with separate files maintained according to sample medium and validation status. The project laboratory shall provide the Project Coordinator and Contractor with computer diskette files containing the analytical data.

### **9.2 GENERAL PROCEDURES FOR DATA REVIEW/VALIDATION**

#### **9.2.1 Level I Data**

Level I data (e.g., screening for VOCs) will be validated by reviewing calibration and maintenance records for field instruments and field logbook information associated with individual data sets to ensure that appropriate SOPs were followed. Data validation, therefore, will be qualitative, and will focus on whether field screening data are of acceptable quality based upon supporting documentation. Acceptance or rejection of data will be determined by the judgement of experienced field personnel familiar with the SOPs.

#### **9.2.2 Level II Data**

Level II data will undergo qualitative and semi-quantitative review based on the standards or performance of the equipment in use. Acceptance or rejection of Level II data will be based on the judgement of qualified personnel. Level II review would include activities similar to Level I, i.e., review of instrument calibration concentrations.

#### **9.2.3 Level III Data**

Generation of the Level III data will include the analysis of QA/QC samples, including blanks, calibration and reference standards, and possibly spiked samples in some instances; however, a complete CLP QA/QC analysis program will not be performed for these samples. Items that will be reviewed to validate the data include:

- 1) Integrity and completeness of the data package,
- 2) Holding times from sample receipt at the laboratory to sample extraction and analysis or holding times from sample receipt to analysis, as appropriate,

- 3) Trip blank and laboratory method blank sample results,
- 4) Matrix spike, matrix spike duplicate, and replicate analyses,
- 5) Surrogate recoveries,
- 6) Field blank sample results, and
- 7) Field duplicate results.

Data validation will be a qualitative process. Review of precision, accuracy, representativeness, completeness and comparability criteria will be included whenever measurement data are reviewed. The analytical laboratory will provide numerical precision and accuracy data that will be compared to the acceptance criteria. Precision and accuracy values for project data sets that are within the ranges for the type of sample and analytical method used will be considered acceptable. In some cases, data of apparently poor precision and/or accuracy may be somewhat useful. The judgement to accept such data, with appropriate qualifications, will be made by a data validator with appropriate technical expertise.

### **9.3 DATA REPORTING**

The project laboratory will report the data in a certificate of analysis format. Sample analytical results and accompanying QA/QC sample results will be reported to the Project Coordinator on computer diskette files suitable for transfer to the spreadsheet data base.

Analytical data will be identified according to the project laboratory's procedures for establishing sample lots, so that sample analysis data can be matched to corresponding QA/QC samples, control charts, and calibration data.

## ***10.0 QUALITY CONTROL***

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The degree of quality control necessary for a sampling and analysis event is influenced by the data quality objectives (as discussed in Section 3 of this SAP).

The quality of the sampling event is, in part, assured by the accurate and complete documentation of all sampling and related activities, by the OHM sampling technician. The use of sample gloves, which are frequently changed out, and the proper decontamination of sampling equipment between sample points, contribute to a successful sampling event.

Disposable equipment are used at only one sample location.

For field screening (QA1), the calibration of the PID with isobutylene, performed twice daily, is sufficient to yield quality information pertinent to volatiles contamination in excavated soil. This information will be used to segregate the soil, accordingly; and for health and safety considerations, in order to evaluate levels of respiratory protection.

Disposal sampling does not require any special QA/QC considerations. Generally, laboratory batch QC results are sufficient for assuring quality of the disposal analysis.

However, post-excavation soil analysis, typically, requires a higher data quality level.

### **10.1 QA/QC SAMPLES**

Quality control for post-excavation and groundwater monitoring can be accessed by the use of QA/QC samples.

#### **10.1.1 Duplicate Samples**

As indicated in Section 3, the precision of the sampling event is accessed by the use of duplicate samples. The precision of the sampling event is expressed as a RPD between duplicate determinations.

Duplicate samples are obtained by simultaneously filling two containers from the same sample source. The duplicate samples are given unique sample numbers, so to not give the laboratory any indication that the sample material is the same, eliminating bias.

#### **10.1.2 Matrix Spike (MS) Samples**

The accuracy of the sampling and analysis is accessed by the use of matrix spike (MS) samples. The % recovery is indicative of the accuracy of the results.

The MS sample will consist of additional sample provided to the laboratory. The laboratory will spike the sample with mixtures of standardized analytes.

#### **10.1.3 Matrix Spike Duplicate (MSD)**

MS analysis is performed on a duplicate sample. The results can be expressed as a % recovery to access accuracy, as for the original MS results; in addition, the RPD between the original MS and the MSD is used to access precision.

#### **10.1.4 Equipment Rinsates**

The equipment rinsate samples are used to assure that contamination is not transferred between sample points, e.g., cross-contamination does not occur. Cross-contamination between sampling points is minimized by decontamination of non-disposable sampling equipment between sample points. Equipment rinsates, therefore, are not required when disposable sampling equipment is utilized.

#### **10.1.5 Trip Blank**

A trip blank is used, generally, only for aqueous volatile samples. For the groundwater monitoring samples, one (1) trip blank will be submitted with each sample batch shipment to the laboratory. The trip blank consist of analyte-free water stored in a 40-ml vial, with no headspace, which is shipped from the laboratory to the site, prior to sampling. The vial is unopened, and is shipped with the samples back to the laboratory. The trip blank is analyzed for volatiles. The laboratory results should indicate that no volatile contamination results from handling and shipping of the samples.

### **10.2 LABORATORY QA/QC**

Laboratory QA/QC analysis includes the preparation of calibration curves, the use of check samples, method blanks, duplicate analysis, and MS/MSD analysis. Commonly, batch QC involves testing of one sample per batch (of 20 samples). One sample (5% QC level) is re-analyzed. Another sample might be spiked then analyzed in duplicate. The results for these analysis apply to all of the samples in the batch.

The standard operating procedures for the laboratory are given in the Laboratory QA/QC Manual.

## ***11.0 PERFORMANCE AND SYSTEM AUDITS***

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Performance and system audits shall be conducted as necessary by both the field and contract laboratories.

## ***12.0 PREVENTATIVE MAINTENANCE***

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Preventative maintenance, as needed, will be provided in a timely manner. All field-related problems will be remediated on a site level. Supplies will be order from the site, as possible.

The OHM Regional Office will be contacted, as necessary. Support of equipment and/or additional personnel will be provided by the OHM Regional Shop in Windsor, New Jersey and the Divisional Office in Hopkinton, Massachusetts.

## ***13.0 CORRECTIVE ACTION***

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Corrective action is required if:

1. Any QC data is outside of the acceptable precision and/or accuracy
2. Blanks or laboratory control samples contain contaminants above acceptable limit
3. Undesirable trends are detected in spike or surrogate recoveries or RPD between duplicates
4. There are unusual changes in method detection limits
5. Deficiencies are detected by the QA department during internal or external audits or from the results of performance evaluation samples
6. Inquiries concerning data quality are received from the Contracting Officer

### **13.1 CORRECTIVE ACTION PROCEDURES**

Corrective actions/procedures for out of control events in the following areas shall be found in the contract laboratory's Quality Assurance Plan. The laboratory QA/QC plan will include standard operating procedures for:

1. Incoming samples
2. Sample holding times
3. Instrument calibrations
4. Practical quantitation limits
5. Method QC
6. Calculation errors
7. On-site audits

## ***14.0 REFERENCES***

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The following references were used in the preparation of this SAP:

- Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program, NEESA 20.2-047B, June 1988, Naval Energy and Environmental Support Activity.
- OHM Field Sampling Manual; March 1989.
- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd ed., Sept. 1986 and Update #1, July, 1992
- Bid Specifications for Melville North Landfill, Naval Education Training Center, Middletown, Middletown, Rhode Island, Delivery Order No. 0025.